

Patent claims

1. Device for generation of microwaves comprising a coaxial virtual cathode oscillator with a rotation symmetrical, outer, cylindrical tube around a central axis forming a cathode and connected to a transmission line for supplying the cathode with voltage pulses, and an inner cylindrical tube, at least partially transparent for electrons, forming an anode and connected to a transmission device for outputting microwave radiation generated by the formation of a virtual cathode inside an area enclosed by the anode, **wherein** the cathode comprises a cylindrical centre conductor arranged to coincide with the centre axle for the outer cylindrical tube and in electrically conductive connection with the outer cylindrical tube.
2. Device as claimed in Patent Claim 1, **wherein** the cylindrical centre conductor has a circular-cylindrical form.
3. Device as claimed in Patent Claims 1 - 2, **wherein** the circular-cylindrical centre conductor is at least partially surrounded by a dielectric material disposed in the anode's waveguide for outputting microwave radiation.
4. Device as claimed in Patent Claim 3, **wherein** the dielectric material is composed of a plastic material.
5. Device as claimed in Patent Claim 3, **wherein** the dielectric material is composed of a ceramic material.
7. Device as claimed in any of the previous Patent Claims, **wherein** the one end of the cylindrical centre conductor is electrically and mechanically connected to a central part of a first electrically conductive wall arranged on the inside of the cathode's cylindrical tube transverse to the longitudinal direction of the tube at a distance from the anode's, for the electron's at least partially transparent, tube.
8. Device as claimed in any of the previous Patent Claims, **wherein** another electrically conductive wall is arranged on the outside of the anode's, for the

electron's at least partially transparent, tube transverse to the longitudinal direction and at a distance from the cathode cylindrical tube.

9. Device as claimed in any of the previous Patent Claims, **wherein** the
5 cylindrical centre conductor essentially consists of metal, such as aluminium, copper, or steel.

10. Device as claimed in any of the previous Patent Claims, **wherein** the
10 transmission line for feeding the cathode is connected to a high voltage generator.

11. Device as claimed in Patent Claim 10, **wherein** the high voltage generator is a
Marx generator.

12. Device as claimed in any of the previous Patent Claims, **wherein** the
15 transmission device for outputting microwave radiation is connected to an antenna.

13. Device as claimed in Patent Claim 10, **wherein** the antenna is a horn antenna.

14. Device as claimed in any of the previous Patent Claims, **wherein** the anode is
20 composed, at least partially, of mesh.

15. Device as claimed in any of the previous Patent Claims, **wherein** the anode is
composed, at least partially, of a thin foil.

25 16. Device as claimed in any of the previous Patent Claims, **wherein** the
transmission device for outputting microwave radiation to a load comprises at least
parts of the inner cylindrical tube as well as a dielectric arranged in the inside of the
tube.

30 17. Device as claimed in any of the previous Patent Claims, **wherein** the
transmission device for outputting microwave radiation to a load comprises a
waveguide arranged between the anode and the load.

18. Device as claimed in any of the previous Patent Claims, **wherein** the centre conductor is hollow.